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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/509,649	03/30/2000	ROBERT ARTHUR LEE	CU-2137TFP	7785

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EXAMINER	
CHANG, AUDREY Y	
ART UNIT	**PAPER NUMBER**
2872	

DATE MAILED: 09/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/509,649	LEE ET AL.	
	Examiner	Art Unit	
	Audrey Y. Chang	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19-26,28 and 30-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19-26, 28 and 30-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Remark

- This Office Action is in response to applicant's response filed on May 24, 2004, which has been entered into the file.
- No amendment to the claims has been submitted.
- Claims 19-26, 28 and 30-36 remain pending in this application.
- Applicant is respectfully reminded about the **new rules requirement** concerns the manner of the amendment, in particular after July 30, 2003, all of the amendment to the claims needs to provide a *complete list* of the claims indicating the status of each claims, (please see 37 CFR 1.121(c)).

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. **Claims 19-23, 26, 28, 30-32 and 35-36 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.**

The reasons for rejections have been set forth in the previous Office Action.

Claim 19 includes the feature of "having a structure selected from predefined **group** of different non-diffracting gray scale region structure types, each structure type having physical characteristics witch provide a particular level of diffuse scattering of incident light". The **specification fails** to give **explicit** teachings about (1) **what** are these "non-diffracting gray scale region **structure types**", (2) **what** specific

structures are included in the "predefined group", and (3) **what** are the "**physical characteristics**" that is capable of providing "a particular level of diffuse scattering of incident light". **The specification fails** to teach specific *working examples* or *operable examples* of such claimed functions which therefore **fails** to enable one skilled in the art to make and/or use the invention. The applicant is respectfully reminded that the specification needs to give explicit teachings as what are considered to be the "predetermined **group** of different non-diffraction gray scale region **structure types**". By saying this verse does not really give any actual teachings about the structures. If the structures are concerning to physical *grooves*, then such should be explicitly taught. The spacing, the size or any other features that give the "different non-diffraction gray scale region structures must be explicitly taught". At this juncture, the specification **fails** to enable one skilled in the art to make and/or use the subject matters stated here. No physical substantial knowledge concerning the "group of structures" is given in the specification. Claim 26 also include the similar phrase "different non-diffracting gray scale region structure types" that is rejected for the same reasons stated above. *Claims 20-23, 28, 30-32, and 34-36 inherit the rejection from their respective base claims.* **Clarifications are required.**

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 19-26, 28, and 30-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Lee (PN. 5,825,547) in view of the patent issued to Solmsdorf (PN. 5,808,758).

Lee teaches a *diffractive device*, having *surface relief structure*, that serves as the *device having surface relief structure*, wherein the diffractive device comprises a plurality of *tracks* that each of the

tracks comprises diffraction grating grooves such that the diffraction gratings generates optically variable images when illuminated. Lee teaches that the diffracting tracks **further** comprise *diffusely reflecting regions* and *specularly reflecting regions within* the diffracting regions or tracks wherein the diffusely reflecting regions are used to *encode auxiliary information*, (please see column 7, lines 39-45). These diffusely reflecting regions are formed by having ***randomly spaces grooves***, which serve as the **non-diffracting** *gray scale regions* and will implicitly give certain level of diffuse scattering of the light depending on the arrangement of the grooves. Lee teaches that the diffracting tracks have a width less than 0.25 mm, which therefore suggests that the **non-diffracting** diffusely reflecting regions also have a width, less than 0.25 mm since these diffusely reflecting regions are **within** the diffraction region of the track. It is implicitly true that the diffusely reflecting regions are *non-diffraction regions* since diffusion phenomenon is different from diffraction phenomenon, also **randomly** spaced grooves cannot cause diffraction of the incident light. Lee teaches *specifically* that these **diffusely** reflecting regions are used to encode **auxiliary information** that are not found in the diffraction image, (please see column 7, lines 43-44). It is implicitly true that these auxiliary information may include graphical text and/or image. Lee further teaches, in a different embodiment, that **graphical micro-writing** (13, Figure 9, column 8, lines 15-34) may be embossed and formed in between the diffraction regions of the diffraction tracks, which correspond to another form of **non-diffraction gray scale regions**.

This reference has met all the limitations of the claims. This reference however does not teach *explicitly* that the diffusely reflecting regions provide *different* levels of diffusing characteristic or gray scale to the incident light. However such feature is either inherently met by the disclosure, since the level of diffusing characteristics depends on the arrangements of the grooves and physical sizes of the grooves, or it would have been obvious to one skilled in the art to for the benefit of allowing the auxiliary information encoded within is viewed with different gray scale to add extra level of security to the device. This reference also does not teach explicitly that the encoded auxiliary information in the diffusely

reflection regions are together to generate a macroscopic graphical, line art or image. However such feature is considered to be obvious matter of design choice to one skilled in art for the benefit of designing the encoded information as desired. **Solmsdorf** in the same field of endeavor also teaches to design the diffusely scattering regions on a data carrier to be arranged to give a macroscopic graphic design, (please see Figure 1). It would therefore have been obvious to one skilled in the art to modify the device of Lee accordingly for the benefit of providing a macroscopically recognizable graphical design to the diffractive device.

With regard to claim 21, Lee teaches that the surface pattern of the diffractive device may have a surface area dimension of 30 micron by 30 micron, it is implicitly true that the area dimension for the diffusely reflecting regions is less than such, (please see column 6, lines 63-65).

With regard to claims 22-23, and 25, Lee does not teach explicitly that the individual diffusely reflecting non-diffraction region comprises an identical or a different image. However such modification is considered to be an obvious matter of ***design choice*** to one skilled in the art for the benefit of having the degrees of freedom to print different types of graphical information for enhancing the ability of anti-forgery and the applications of the document.

With regard to claim 28, Lee teaches that the diffraction tracks having diffraction grating regions with relief grooves structure that each of the diffraction gratings generates an optical variable image upon illumination of light. Optical variable image means the image varied in response to the viewing direction and position of the observer.

With regard to claim 30, Lee teaches to include the above- mentioned diffusely reflecting regions and specularly reflecting regions, which have the ability of enhancing the contrast of the diffracted images stored in the diffraction tracks. It is known in the art that the non-diffraction regions interposed between the diffraction regions have the ability of enhancing the diffracted images of the diffraction regions.

With regard to claims 34-36, Lee teaches that the diffractive device may be adapted for application as security devices for currency notes or credit card. The idea of matching the image presented by the diffractive device and the currency note or credit card is *an obvious matter of design choice* to one skilled in the art since it involves only routine skill in the art and it has the advantages of serving the purpose of anti-forgery. The manners with respect to the actual inspection of the authentication of the security device having the diffraction gratings, recited in claims 35 and 36, do not differentiate the claimed device from prior art device satisfying the claimed structural limitations. Ex Parte Masham, 2 USPQ 2d 1647 (1987).

Response to Arguments

5. Applicant's arguments filed on May 24, 2004 have been fully considered but they are not persuasive.

6. In response to applicant's arguments concerning the non-enablement rejection under 35 USC 112, first paragraph, which states that "*any persons skilled in the relevant art would construe* "non-diffracting gray scale regions structure type" to refer surface relied structure type which are not-diffracting and which scatter incident light in different directions such that a region composed of structures of a particular type will appear to be particular shade of gray, the particular shade of gray being dependent on the diffuse scattering characteristics of each particular structure attributable to its physical structure" therefore the applicant needs not to provide the **specific teachings** of the (1) "non-diffracting gray scale region **structure types**", (2) **the** specific **structures** included in the "predefined group", and (3) the "**physical characteristics**" that is capable of providing "a particular level of diffuse scattering of incident light", is *respectfully non-acceptable*. The applicant and any person skilled in the art would understand **any** physical surface has certain relief structure, i.e. surface roughness, that will cause scattering of the incident light and will diffuse light in certain gray scale. Does the applicant therefore mean the device is *any surface*? Also the applicant and any person skilled in the art would understand that even **grating**

relief structure will only **diffracts** light with *certain range* of wavelengths and for the light having wavelength not in the range the grating relief structure will scatter the light in non-diffracting manner. The crucial factor in deciding "non-diffracting" and "diffracting" is therefore not about the structure itself rather about the wavelength of the incident light. In this manner, the applicant **further fails** to explain what are these "**structure types**" that are *non-diffracting.* If one skilled in the art would construe the limitations concerning the "non-diffracting gray scale region type" then why can the applicant provide an example to demonstrate it? The specification at this juncture really provides NO working examples to demonstrate the claimed "types".

7. In response to applicant's arguments concerning the cited Lee reference teaches a device for presenting optical *variable* images that is different from the instant application concerning the device for generating optical *invariable* image, the examiner respectfully disagrees for the following reasons. **Firstly**, the features concerning either "optical variable image" or "optical invariable image" are **not** specifically stated in the claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). **Secondly**, the optical variable image is provided by the *diffraction regions*, not the non-diffraction, diffusely reflection regions, of Lee reference, which is an *implicitly* property of the diffraction grating. The diffractive regions of the instant application will also provide the similar optical variable image. The Lee reference therefore reads on the instant application. **Thirdly**, the instant application in claim 19 recites "the diffracting gray scale region type having, by reason of their differing diffuse scattering characteristics, **different intensities** when the device is illuminated by a light source and viewed by an observer from **any direction",** which by any means is "**optical variable**". *The instant application therefore ALSO claims an optically variable device.*

8. In response to applicant's arguments concerning the cited Lee reference does not teach that the non-diffracting specularly reflecting regions generate an image, the examiner respectfully disagrees and

would ask the applicant to study Lee's reference more closely. Lee teaches that the non-diffracting specularly reflecting regions incorporates *auxiliary information* which may implicitly include at least a line which reads on "the line art" of the instant application. Also by the same admission of the applicant that one skilled in the art will construe that the micro-writing (13, Figure 9) certainly serves as one **type** of non-diffracting gray scale structure type that provide graphic characters. The micro-writing is embossed and has a dimension of 2 micron or less, (please see column 8, lines 25-35).

9. In response to applicant's arguments concerning the Solmsdorf reference the applicant is respectfully noted that the reference is cited to demonstrate that it is obvious to one skilled in the art to provide "**diffusely scattering areas with different intensities when observed at different viewing angles**", whether it provides recognizable graphic information or not is not the issue here. Lee has already demonstrated such feature. Also the applicant is respectfully noted that Solmsdorf reference teaches more that one **type** of non-diffracting gray scale regions.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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